

IN THE CLAIMS:

- 1 1.(Currently amended) An electronically tuned circuit, comprising a power amplifier
2 coupled to an electronically tunable output network, said power amplifier capable of
3 being operated in a large-signal mode, said output network including an electronically
4 tunable reactive component, a control line, and a control input, ~~said control input~~
5 ~~available for connection from external to said output network~~, further wherein said
6 control input is connected to a time varying tuning input signal, wherein electronic
7 tuning of said electronically tunable reactive component includes non-motor operated
8 electronic tuning when said power amplifier is operated in said large-signal mode,
9 wherein said control line extends to said electronically tunable reactive component for
10 providing a control signal derived from said time varying tuning input signal, wherein
11 said control signal varies over more than two values for electronically varying
12 reactance of said electronically tunable reactive component over more than two
13 values, wherein said time varying tuning input signal is independent of a signal
14 amplified by said power amplifier.
- 1 2. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 varying reactance of said electronically tunable reactive component tunes said output
3 network to a selected frequency.
- 1 3. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 varying reactance of said electronically tunable reactive component tunes said output
3 network to maintain a match between said output network and a varying load
4 impedance .
- 1 4. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 varying reactance of said electronically tunable reactive component adds modulation
3 to a large signal in said output network.

- 1 5. (Previously presented) An electronically tuned circuit as in claim 4, wherein said
2 varying reactance of said reactive component provides a power-amplifier
3 load-impedance locus that substantially maximizes power-amplifier efficiency.

- 1 6.(Previously presented) An electronically tuned circuit as in claim 5, wherein said
2 varying reactance of said reactive component causes said power-amplifier load
3 impedance to follow a substantially resistive locus, thereby maintaining
4 power-amplifier efficiency near maximum.

- 1 7. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 varying reactance of said reactive component tunes said output network in accordance
3 with a predetermined set of tuning inputs.

- 1 8. (Previously presented) An electronically tuned circuit as in claim 7, wherein said
2 tuning inputs are selected in accordance with a lookup table.

- 1 9. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 varying reactance of said reactive component tunes said output network in accordance
3 with a predetermined lookup table of tuning inputs.

- 1 10. (withdrawn) An electronically tuned circuit as in claim 1, wherein said varying
2 reactance of said reactive component tunes said output network in accordance with a
3 sample of the amplifier output.

- 1 11. (Withdrawn) An electronically tuned circuit as in claim 1, wherein said varying
2 reactance of said reactive component tunes said output network in accordance with a
3 sample of the network output.

- 1 12. (Withdrawn) An electronically tuned circuit as in claim 1, wherein said varying
2 reactance of said reactive component tunes said output network in accordance with a
3 sample of a radiated signal.
- 1 13. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 electronically tunable reactive component includes an electronically tunable
3 capacitor.
- 1 14. (Previously presented) An electronically tuned circuit as in claim 13, wherein said
2 electronically tunable capacitor includes a transistor.
- 1 15. (Previously presented) An electronically tuned circuit as in claim 13, wherein said
2 electronically tunable capacitor includes a diode.
- 1 16. (Previously presented) An electronically tuned circuit as in claim 13, wherein said
2 electronically tunable capacitor includes a diode having a control terminal.
- 1 17. (Previously presented) An electronically tuned circuit as in claim 13, wherein said
2 electronically tunable capacitor includes a micro electro-mechanical system device.
- 1 18. (Previously presented) An electronically tuned circuit as in claim 13, wherein said
2 electronically tunable capacitor includes a variable-dielectric material.
- 1 19. (Previously presented) An electronically tuned circuit as in claim 13, wherein said
2 electronically tunable capacitor includes a piezo-electric device.
- 1 20. (Withdrawn) An electronically tuned circuit as in claim 1, wherein said electronically
2 tunable reactive component includes at least one inductive component adapted to be
3 electronically tuned in inductance.

- 1 21. (Withdrawn) An electronically tuned circuit as in claim 20, wherein said at least one
2 inductive component includes a variable- permeability core.
- 1 22. (Withdrawn) An electronically tuned circuit as in claim 20, wherein said at least one
2 inductive component includes a piezo-electric device.
- 1 23. (Withdrawn) An electronically tuned circuit as in claim 1, wherein said electronically
2 tunable reactive component includes at least one transmission line adapted to be
3 electronically tuned in electrical characteristics.
- 1 24. (Withdrawn) An electronically tuned circuit as in claim 23, wherein said at least one
2 transmission-line includes an electrically variable dielectric material.
- 1 25. (Withdrawn) An electronically tuned circuit as in claim 23, wherein said at least one
2 transmission-line includes an electrically variable magnetic material.
- 1 26. (Withdrawn) An electronically tuned circuit as in claim 1, further comprising a
2 passive filter coupled to said output network for removing undesired harmonic
3 frequencies.
- 1 27. (Withdrawn) An electronically tuned circuit as in claim 1, wherein said power
2 amplifier includes an amplifier input, further comprising a second electronically
3 tunable reactive component coupled to said amplifier input for tuning said amplifier
4 input.
- 1 28. (Previously presented) An electronically tuned circuit as in claim 1, further
2 comprising a controller, said controller for providing a signal for controlling said
3 electronically tunable output network.

- 1 29. (Previously presented) An electronically tuned circuit as in claim 28, wherein said
2 controller includes a controller input, further comprising an envelope detector with
3 an envelope-detector input and envelope-detector output, said envelope-detector
4 output coupled to said controller input, said envelope detector being responsive to an
5 input RF signal and providing a modulation input to said controller.
- 1 30. (Previously presented) An electronically tuned circuit as in claim 28, further
2 comprising a drive-level adjustor coupled for adjusting amplitude of a signal
3 provided to said power amplifier.
- 1 31. (Previously presented) An electronically tuned circuit as in claim 1, further
2 comprising a digital signal processor coupled to said power amplifier and to said
3 electronically tunable output network, said processor for providing a drive signal to
4 said power amplifier and said time varying tuning input signal to said electronically
5 tunable output network.
- 1 32. (Previously presented) An electronically tuned circuit as in claim 31, further
2 comprising a controller coupled to said digital signal processor and to said
3 electronically tunable output network, wherein output of said digital signal processor
4 is directed to said controller and wherein output of said controller is directed to said
5 electronically tunable output network.
- 1 33. (Previously presented) An electronically tuned circuit as in claim 1, further
2 comprising a drive-level adjustor coupled for adjusting amplitude of a signal
3 provided to said power amplifier.
- 1 34. (Previously presented) An electronically tuned circuit as in claim 33, wherein said
2 varying reactance of said reactive component and said drive-level adjuster add
3 modulation to a large signal in said output network.

1 35. (Previously presented) An electronically tuned circuit as in claim 34, wherein said
2 circuit is for providing a desired circuit output, wherein when said desired circuit
3 output has an amplitude that is above a threshold said electronically tunable output
4 network is used to control amplitude and when said desired circuit output is below a
5 threshold said drive level adjuster is used to control amplitude.

1 36. (Previously presented) An electronically tuned circuit as in claim 33, further
2 comprising a controller for converting said time varying tuning input signal into
3 tuning signals for control of said electronically tunable reactive component.

1 37. (Previously presented) An electronically tuned circuit as in claim 1, further
2 comprising a bias input for controlling bias level of said power amplifier.

1 38. (Previously presented) An electronically tuned circuit as in claim 37, wherein said
2 bias level is controlled to equal a minimum level necessary to enable operation of
3 said power amplifier, thereby reducing power consumption.

1 39. (Previously presented) An electronically tuned circuit as in claim 37, further
2 comprising a controller for adjusting said bias level in response to at least one from
3 the group including frequency, impedance, and modulation inputs.

1 40. (Currently amended) An electronically tuned circuit comprising:

2 (a) means for power amplifying, wherein said means for power amplifying
3 comprises a large-signal mode; and

4 (b) means for electronic tuning of said means for power amplifying when
5 said means for power amplifying is operating in said large signal
6 mode, wherein said means for electronic tuning is coupled to said
7 means for power amplifying, wherein said means for electronic tuning
8 comprises an electronically tunable reactive component, a control line,
9 and a control input, said control input available for connection from
10 external to said means for electronic tuning, further wherein said
11 control input is connected to a time varying tuning input signal,
12 wherein said electronically tunable reactive component includes non-
13 motor operated electronic tuning, wherein said control line extends to
14 said electronically tunable reactive component for providing a control
15 signal derived from said time varying tuning input signal, wherein said
16 control signal varies over more than two values for electronically
17 varying reactance of said electronically tunable reactive component
18 over more than two values, wherein said time varying tuning input
19 signal is independent of a signal amplified by said power amplifier.

1 41. (Previously presented) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and said electronic-tuning means is
3 capable of being tuned to provide a reactance for optimum class-E operation for a
4 selected frequency.

1 42. (Previously presented) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and said electronic-tuning means is
3 capable of being tuned to provide a reactance for optimum class-E operation while
4 delivering power to a selected load impedance.

1 43. (Previously presented) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and said electronic-tuning means is
3 capable of being tuned to provide a reactance for optimum class-E operation while
4 simultaneously modulating the output of said electronic-tuning means.

1 44. (Previously presented) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and further comprising a fixed
3 reactance for optimum class-E operation at a first frequency, wherein said means for
4 electronic tuning is capable of being tuned to provide said power amplifying means
5 with a load impedance for optimum class-E operation for a selected second
6 frequency.

1 45. (Previously presented) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and further comprising a fixed
3 reactance for optimum class-E operation with a first load impedance, wherein said
4 means for electronic tuning is capable of being tuned to provide said power
5 amplifying means with a load impedance for optimum class-E operation with a
6 second load impedance different from said first load impedance.

- 1 46. (Previously presented) An electronically tuned circuit as in claim 40, wherein said
2 means for electronic tuning is connected to an output terminal, wherein said means
3 for power amplifying operates in class E and said means for electronic tuning is
4 capable of being tuned to provide an impedance for optimum class-E operation when
5 said output terminal is delivering a maximum output signal amplitude, and said
6 means for electronic tuning is capable of being tuned to provide suboptimum class E
7 operation when said output terminal is delivering less than a maximum output signal
8 amplitude.
- 1 47. (Withdrawn) An electronically tuned circuit as in claim 1, comprising a plurality of
2 amplifier subsystems, wherein each of said amplifier subsystems includes one said
3 power amplifier coupled to an electronically tunable output network, wherein said
4 amplifier subsystems are coupled to a power combiner for delivery of signals from
5 said amplifier subsystems to a common load.
- 1 48. (withdrawn) An electronically tuned power amplifier system as in claim 47, wherein
2 each said varying reactance of each said electronically tunable reactive component
3 tunes said output network to a selected frequency.
- 1 49. (Withdrawn) An electronically tuned power amplifier system as in claim 47, wherein
2 each said varying reactance of said electronically tunable reactive component tunes
3 said output network to match a desired load impedance.
- 1 50. (Withdrawn) An electronically tuned power amplifier system as in claim 47, wherein
2 each said varying reactance of each said electronically tunable reactive component
3 adds modulation to a large signal in each said output network.

- 1 51. (Withdrawn) An electronically tuned power amplifier system as in claim 47, wherein
2 said output networks are adapted to cancel reactances resulting from combining said
3 signals.
- 1 52. (Withdrawn) An electronically tuned power amplifier system as in claim 47, further
2 comprising a controller for generating drive and control signals for each subsystem.
- 1 53. (Withdrawn) An electronically tuned power amplifier system as in claim 52, wherein
2 said controller is adapted to generating drive signals of different phases for
3 production of an amplitude-modulated system output.
- 1 54. (Withdrawn) An electronically tuned power amplifier system as in claim 52, wherein
2 said output networks are adapted to cancel time varying reactances resulting from
3 combining out-of-phase signals.
- 1 55. (Withdrawn) An electronically tuned power amplifier as in claim 47, further
2 comprising a passive filter coupled to said power combiner for removing undesired
harmonic frequencies and distortion products.

1 56. (Currently amended) An electronically tuned circuit, comprising one or more power
 2 amplifiers, wherein said power amplifiers are capable of operating in a large-signal
 3 mode, further wherein said one or more power amplifiers has an output network, said
 4 output network including a tuning input, a network output, an electronically tunable
 5 reactive component, a control line, ~~said control line extending between said device~~
 6 ~~and said electronically tunable reactive component, wherein said tuning input is~~
 7 ~~available for connection from external to said output network, further wherein said~~
 8 tuning input is connected to a time varying tuning input signal, wherein electronic
 9 tuning of said electronically tunable reactive component includes non-motor
 10 operated electronic tuning when said one or more power amplifiers are operating in
 11 said large-signal mode, wherein said control line extends to said electronically
 12 tunable reactive component for providing a control signal derived from said time
 13 varying tuning input signal, wherein said control signal varies over more than two
 14 values for electronically varying reactance of said electronically tunable reactive
 15 component over more than two values, wherein said time varying tuning input signal
 16 is independent of a signal amplified by said power amplifier.

1 57. (Previously presented) An electronically tuned circuit as in claim 56, wherein said
 2 varying reactance of said electronically tunable reactive component tunes said output
 3 network to a fixed or variable frequency.

1 58. (Previously presented) An electronically tuned circuit as in claim 56, wherein said
 2 varying reactance of said electronically tunable reactive component tunes said output
 3 network to maintain a match with a varying load impedance at said network output.

1 59. (Previously presented) An electronically tuned circuit as in claim 56, wherein said
 2 varying reactance of said electronically tunable reactive component adds modulation
 3 to a large signal in said output network.

1 60. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 output network includes at least two reactive components connected as a tuned
3 circuit, wherein said electronically tunable reactive component includes at least one
4 of said reactive components.

1 61. (Previously presented) An electronically tuned circuit as in claim 28, wherein said
2 controller converts an input signal to a voltage suitable for controlling said tunable
3 output.

1 62. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 electronically tunable reactive component is continuously variable.

1 63. (Previously presented) An electronically tuned circuit as in claim 40, wherein said
2 electronically tunable reactive component is continuously variable.

1 64. (Previously presented) An electronically tuned circuit as in claim 56, wherein said
2 electronically tunable reactive component is continuously variable.